

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: John G. Leishman, et al. : Group  
Serial No: 10/618,645 : Art Unit #3745  
Filed: 15 July 2003 : Examiner  
Title: ROTOR BLADE SYSTEM WITH : Unknown  
REDUCED BLADE-VORTEX  
INTERACTION NOISE

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Honorable Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The Applicants wish to make the following art references of record in the above-identified Patent Application pursuant to 37 C.F.R. §§ 1.97 and 1.98, and to the Duty of Disclosure set forth in 37 C.F.R. § 1.56.

Although the information submitted herewith may be "material" to the Examiner's consideration of the subject Patent Application, this submission is not intended to constitute an admission that such information is "prior art" as to the claimed invention.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Supplemental Information Disclosure Statement shall not be construed to mean that a search was made or that no other material information, as defined in 37 C.F.R. § 1.56(b), exists.

MR2833-27  
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Cited Publications are:

<u>Ref. No.</u>	<u>Description</u>
AA	Leishman, J.G., and Bagai, A., "Challenges in Understanding the Vortex Dynamics of Helicopter Rotor Wakes," <i>AIAA Journal</i> , Vol. 36, No. 7, July 1998, pp. 1130-1140.
AB	Leishman, J.G., <i>Principles of Helicopter Aerodynamics</i> , Cambridge University Press, 2000, Chapter 10.
AC	Schmitz, F.H., "Rotor Noise," Chapter 2, <i>Aeroacoustics of Flight Vehicles: Theory and Practice</i> , Vol. 1, NASA Reference Publication 1258, Aug. 1991.
AD	Berry, J.D., and Mineck, R.E., "Wind Tunnel Test for an Articulated Helicopter Rotor Model with Several Tip Shapes," NASA-TM-80080, December, 1980.
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AF	Tangler, J.L., "Experimental Investigation of the Sub-wing Tip and Its Vortex Structure," NASA CR-3058, 1978.
AG	Marchman, J.F. III, and Uzel, J.N., "Effect of Several Wing Tip Modifications on a Trailing Vortex," <i>Journal of Aircraft</i> , Vol. 9, No. 9, 1972, pp. 684-686.
AH	McAlister, K.W., Tung, C., and Heineck, J.T., "Devices that Alter the Tip Vortex of a Rotor," NASA/TM-2001-209625 (AFDD/TR-01-A-003), 2001.
AI	Kantha, H.L., Lewellen, W.S., and Durgin, F.H., "Response of a Trailing Vortex to Axial Injection into the Core," <i>Journal of Aircraft</i> , Vol. 9, No. 3, 1972, pp. 254-256.

AJ Liu, Z., Russel, J.W. and Sankar, L.N., "A study of Rotor Tip Structure Alteration Technique," *Journal of Aircraft*, Vol. 38, No. 3, 2001, pp. 473-477.

AK Han, Y.O., and Bae, H., "Modification of the Tip Vortex by Span-wise Slots," *KSAS Korean Journal*, Vol. 27, No. 5, 1998, pp. 1-7.

AL Han, Y.O., and Chung, W.J., "Mean and Turbulent Characteristics of Tip Vortices Generated by a Slotted Model Blade," Proceedings of 5<sup>th</sup> Engineering Turbulence Modeling and Measurements, Malloca, Spain, 2002, pp. 637-646.

AM Martin, P.B., Bhagwat, M.J., and Leishman, J.G., "Strobed Laser-Sheet Visualization of a Helicopter Rotor Wake," 2<sup>nd</sup> Pacific Symposium on Flow Visualization and Image Processing, Honolulu, Hawaii, 1999.

AN Bhagwat, M.J., and Leishman, J.G., "Stability Analysis of Rotor Wakes in Axial Flight," *Journal of the American Helicopter Society*, Vol. 45, No. 3, 2000, pp. 165-178.

AO Leishman, J.G., "Seed Particle Dynamics in Tip Vortex Flow," *Journal of Aircraft*, Vol. 33, No. 4, 1996, pp. 823-825.

AP Martin, P.B., Pugliese, G.J., and Leishman, J.G., "Laser Doppler Velocimetry Uncertainty Analysis For Rotor Blade Tip Vortex Measurements," AIAA CP 2000-0263, 38<sup>th</sup> Aerospace Sciences Meeting and Exhibit, Reno, NV, 2000.

AQ Barrett, R.V., and Swales, C., "Realisation of the Full Potential of the Laser Doppler Anemometer in the Analysis of Complex Flows," *Aeronautical Journal*, Vol. 102, No. 10, 1998, pp. 313-320.

AR Tung, C., Caradonna, F.X., and Morse, H.A., "The Structure of Trailing Vortices Generated by Model Rotor Blades," *Vertica*, Vol. 7, 1983, pp. 33-43.

AS Tennekes, H, and Lumley, J.L., *A First Course in Turbulence*, MIT Press, 1972.

AT Vatistas, G.H., Kozel, V., and Mih, W.C., "Simpler Model for Concentrated Vortices," *Experiments in Fluids*, Vol. 24, No. 11, 1991, pp. 73-76.

AU Lamb, H., *Hydrodynamics*, 6<sup>th</sup> Ed. Cambridge University Press, Cambridge, UK, 1932.

AV Oseen, C.W., "Über Wirbelbewegung in Einer Reiben den Flussigkeit," *Ark. J. Mat. Astrom. Fys.*, Vol. 7, 1912, pp. 14-21.

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AZ Cotel, A.J., and Breidenthal, R.E., "Turbulence Inside a Vortex," *Physics of Fluids*, Vol. 11, No. 10, 1999, pp. 3026-3029.

BA Bradshaw, P., "The analogy Between Streamline Curvature and Bouyancy in Turbulent Shear Flows," *Journal of Fluid Mechanics*, Vol. 36, Part 1, pp. 177-191.

BB Iverson, J.D., "Correlation of Turbulent Trailing Vortex Decay Data," *Journal of Aircraft*, Vol. 13, No. 3, 1976, pp. 338-342.

BC Devenport, W.J., Rife, M.C., Liapis, S.I., and Follin, G.J., "The Structure and Development of a Wing-Tip Vortex," *Journal of Fluid Mechanics*, Vol. 312, 1996, pp. 67-106.

BD Leishman, J.G., "Measurements of the Aperiodic Wake of a hovering Rotor," *Experiments in Fluids*, Vol. 25, 1998, pp. 352-361.

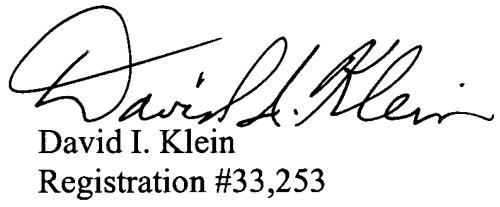
MR2833-27  
Serial Number: 10/618-645

BE        Gursul, I., and Xie, W., "Origin of Vortex Wandering Over Delta Wings,"  
*Journal of Aircraft*, Vol. 37, No. 2, 1999, pp. 348-350.

This Supplemental Information Disclosure Statement is being filed more than three months subsequent to the Filing Date of the subject Patent Application, but before the mailing of a first Office Action.

A Form PTO-1449 and copies of the references are submitted along with this document. It is requested that the Examiner consider the references and make them of record in the above-referenced Patent Application.

Respectfully submitted,  
FOR: ROSENBERG, KLEIN & LEE



David I. Klein  
Registration #33,253

Dated: *20 Aug. 2004*

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INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

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Sheet

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of

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Application Number	10/618,645
Filing Date	15 JULY 2003
First Named Inventor	JOHN G. LEISHMAN
Art Unit	3745
Examiner Name	UNKNOWN
Attorney Docket Number	MR2833-27

## NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
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				Application Number	10/618,645
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				First Named Inventor	JOHN G. LEISHMAN
				Art Unit	3745
				Examiner Name	UNKNOWN
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	AU	Lamb, H., Hydrodynamics, 6th Ed. Cambridge University Press, Cambridge, UK, 1932.			
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